WHAT IS CLAIMED IS:

1. A method for initiating a contention-free burst by a hybrid coordinator of a network using a shared communications medium comprising:

    determining a status of the shared communications medium;

    waiting for access to the shared communications medium based on the status of the shared communications medium; and

    transmitting information after expiration of a specified period of time.

2. The method of claim 1, wherein the status of the shared communications medium is idle, and wherein the waiting step comprises ensuring that the shared communications medium has been idle for at least a point coordination function inter-frame space (PIFS) period.

3. The method of claim 1, wherein the status of the shared communications medium is busy due to a transmission, and wherein the waiting step comprises:

    determining a source of the transmission;

    waiting until the transmission completes; and

    waiting for a specified period of time.

4.   The method of claim 3, wherein the source of the transmission was determined to have originated from a same BSS, and wherein the specified period of time is equal to a short inter-frame space (SIFS) period.

5   5.   The method of claim 3, wherein the source of the transmission was determined to have originated from a same BSS, and wherein the specified period of time is equal to a point coordination function inter-frame space (PIFS) period.

10   6.   The method of claim 1, wherein the contention-free burst is of limited duration and the hybrid coordinator has more information to transmit than can be transmitted in the contention-free burst, the method further comprises:

       (1) waiting a second specified time period after the completion of the
15   contention-free burst;

       (2) generating a backoff time;

       (3) initiating a backoff procedure; and

       (4) initiating a new contention-free burst when the backoff procedure completes.

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7.   The method of claim 6, wherein the second specified time period is a point coordination function inter-frame space (PIFS) period.

8.   The method of claim 6, wherein the initiating step comprises:

inserting the backoff time into a backoff timer;

decrementing the backoff timer each time an idle slot expires; and

completing the backoff procedure when the backoff counter reaches zero.

9.   The method of claim 6, wherein the method is repeated until the hybrid coordinator transmits all of its information.

10.   The method of claim 6, wherein a second hybrid coordinator may take control of the shared medium by initiating a contention-free burst of its own while the hybrid coordinator is attempting to initiate a new contention-free burst.

11.   The method of claim 10, wherein the second hybrid coordinator may initiate the contention-free burst after the shared medium has been idle for a PIFS period.

12. The method of claim 6, wherein the backoff time is randomly chosen

from a contention window of [0, CWHC)

where CWHC = CWHCmin + 1, and CWHCmin is a prespecified value.

13. The method of claim 12, wherein a collision occurs due to the

initiating of the new contention-free burst, and wherein the method

comprises an additional step of (5) repeating steps (1)-(4) with the backoff

time being randomly chosen from a contention window of [0, 2*CWHC).

14. The method of claim 13, wherein the contention window is doubled

each time the method repeats due to a collision resulting from the initiating

of the new contention-free burst.

15. The method of claim 14, wherein the contention window has a

maximum size of [0, CWHCmax + 1)

where CWHCmax is a prespecified value.

16. The method of claim 15, wherein a default value of CWHCmax is

equal to CWHCmin and CWHCmin is defaulted to three time slots.

17. A method for access recovery in a shared medium comprising:

transmitting a frame to a destination to initiate a contention-burst;

waiting for an expected response from the destination within a first

time period;

5   if the expected response from the destination does not arrive within

the specified time period, then:

sensing a status of the shared medium;

waiting a second time period; and

regaining control of the shared medium.

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18. The method of claim 17, wherein the first period of time is a point

coordinator function inter-frame space (PIFS) period.

19. The method of claim 17, wherein the second time period is equal to a

15   third time period plus a backoff time.

20. The method of claim 17, wherein a wireless station is in control of the

shared medium, and wherein the status of the shared medium is idle, and

wherein the specified time period is equal to one short inter-frame space

20   (SIFS) period.

21.   The method of claim 20, wherein the wireless station will regain control of the shared medium by transmitting a second frame one time slot after waiting the first specified period of time after the end of the first transmission, only if sufficient time remains in a transmission opportunity

5   granted to the wireless station to transmit the second frame plus receive an acknowledgment corresponding to the second frame.

22.   The method of claim 20, wherein a hybrid coordinator may regain control of the shared medium one PIFS period after a transmission

10   opportunity granted to the wireless station expires.

23.   The method of claim 17, wherein a hybrid coordinator is in control of the shared medium, and wherein the status of the shared medium is idle, and wherein the waiting a second time period step comprises initiating a

15   random backoff procedure.

24.   The method of claim 23, wherein the initiating step comprises:

generating a backoff period;

loading a backoff counter with the backoff period;

20   decrementing the backoff counter each time an idle slot expires; and

completing the backoff procedure when the backoff counter reaches

zero.

25.   The method of claim 24, wherein the backoff period is a value

randomly selected from a contention window.

26.   The method of claim 25, wherein the contention window is of size [0,

CWHC), wherein 0 is included and CWHC is excluded, wherein CWHC is

equal to CWHCmin plus one, and wherein CWHCmin is a prespecified

value.

27.   The method of claim 26, wherein the contention window doubles in

size each time another backoff period is selected following a failed access

recovery.

28.   The method of claim 27, wherein a maximum contention window size

is fixed at [0, CWHCmax + 1), wherein CWHCmax is a prespecified value.

29.   The method of claim 28, wherein a default value of CWHCmax is

equal to CWHCmin, and wherein a default value of CWHCmin is equal to

three time slots.

30.   The method of claim 17, wherein a hybrid controller is in control of the shared medium, and the status of the shared medium is busy, and wherein the waiting a second time period step comprises:

5   waiting a period of time, wherein the period of time is equal to a sum of a point coordinator function inter-frame space (PIFS) period plus the larger of a time while the shared medium is busy or a transmission opportunity specified in the frame; and

           initiating a backoff procedure.

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31.   The method of claim 30, wherein the initiating step comprises:

           generating a backoff period;

           loading a backoff counter with the backoff period;

           decrementing the backoff counter each time an idle slot expires; and

15   completing the backoff procedure when the backoff counter reaches zero.

32.   The method of claim 17, wherein the regaining step comprises transmitting a second frame to a second destination station initiating a new

20   contention free burst.

33. The method of claim 32, wherein the second destination is the same as the first destination station.

34. The method of claim 32, wherein the second destination is different from the first destination station.

35.   A circuit comprising:

a memory;

a processor coupled to the memory, the processor containing

circuitry to manage communications in a shared medium, the processor

5   further comprises an error processor to detect and recover from

transmissions damaged by collisions from other transmissions;

a transmit/receive unit coupled to the processor, the transmit/receive

unit to transmit and receive data frames from the shared medium; and

a medium sensor unit coupled to the processors, the medium sensor

10   to detect a state of the shared medium.

36.   The circuit of claim 35, wherein the medium sensor unit is internal to

the transmit/receive unit.

15   37.   The circuit of claim 35, wherein the medium sensor unit asserts a

medium status signal flag depending on the state of the shared medium.

38.   The circuit of claim 35, wherein the error processor determines when

the circuit can safely reclaim control of the shared medium.

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39. The circuit of claim 35, wherein the error processor determines an occurrence of errors and a nature of the errors based on the status of the shared medium and contents of transmissions on the shared medium.

40.   A communications system comprising:

a shared medium;

at least two communications stations, coupled to the shared medium,

each communications station comprising:

5   a memory;

a processor coupled to the memory, the processor containing

circuitry to manage communications in a shared medium, the processor

further comprises an error processor to detect and recover from

transmissions damaged by collisions from other transmissions;

10   a transmit/receive unit coupled to the processor, the

transmit/receive unit to transmit and receive data frames from the shared

medium; and

a medium sensor unit coupled to the processors, the medium

sensor to detect a state of the shared medium.

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41.   The communications system of claim 40, wherein the

communications system further comprises a hybrid coordinator coupled to

the shared medium, the hybrid coordinator further comprising:

a memory;

20   a processor coupled to the memory, the processor containing

circuitry to manage communications in a shared medium, the processor

further comprises an error processor to detect and recover from transmissions damaged by collisions from other transmissions;

a transmit/receive unit coupled to the processor, the transmit/receive unit to transmit data frames to, and receive data frames from, the shared

5   medium; and

a medium sensor unit coupled to the processors, the medium sensor to detect a state of the shared medium.

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